To: Professor Sury

From: Benjamin Kanarick

Re: Estimating Beta via SCL and Comparables Analysis

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Introduction:

The goal of this assignment is to identify a publicly traded company that operates in numerous distinguishable sectors and/or lines of business. Once this company is identified, an estimate of said company's beta will be provided using two methods: SCL analysis and comparables (comps) analysis. The reason for this analysis is to understand how sensitive this company is to systematic (market) risk, and from there extract return and volatility information as well.

Methods and Procedure:

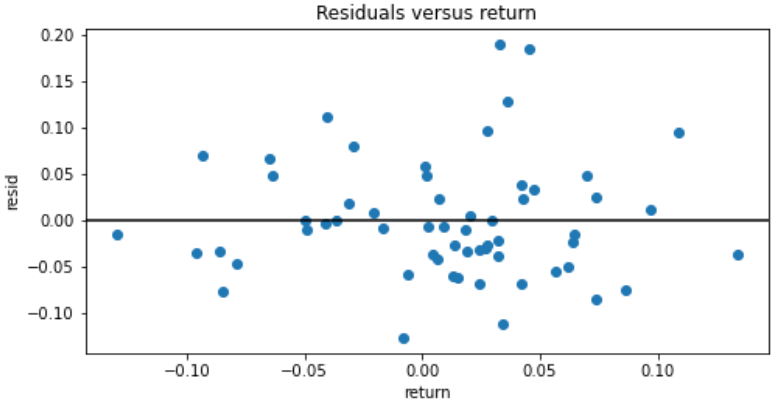
The first step of this process was to choose a publicly traded company with extensive reach and operates in multiple lines of business. The firm chosen was Disney, which operates in both the video entertainment realm as well as the travel, hospitality, and tourism space.

Step 1: Estimating Disney's Historical Beta through SCL analysis:

The first approach to estimate Disney's beta was through a historical SCL analysis, where monthly data over the last 5 years for both the S&P 500 ETF ($SPY) and The Walt Disney Company ($DIS) was downloaded. From these prices, monthly returns were calculated and then regressed Disney's returns against the market (S&P) using the regression tool in excel.

As for results, it was found that Disney's beta was estimated to be 1.21 with a standard error of 0.1569 and a t-stat of 7.719. This t-statistic indicates that we are 7.719 standard deviations away from 0, leading us to say that we are confident our estimated beta is statistically significantly different from 1. Furthermore, our 95% confidence interval for the beta of 1.21 is between 0.8972 and 1.5257. We get this 95% range by going -2 and +2 standard errors away from our estimated coefficient, capturing 95% of a normal distribution.

The regression method was verified by plotting the residual using Python. The residual plot is below:



Based on the plot, it seems that the errors are independent from each other as there seems to be no pattern in the residual plot. This further confirms that this is a valid linear regression.

Step 2: Estimating Disney's Beta through comparables analysis:

The next approach that was taken to estimate Disney's beta was through comparables analysis. Before we dive into selecting proper comparable companies for Disney, it is important to note the two different lines of business Disney operates in. Per analysis of Disney's 10K, the first line of business is the DMED, which is the Disney Media and Entertainment Distribution branch. The DMED covers all movie, streaming, movie production, and internet content that Disney provides to its customers. The second line of business is the DPEP, which is the Disney Parks, Experiences and Products branch. The DPEP primarily focuses on operations relevant to Disney's parks, resorts, restaurants, and any other line that falls under their tourism umbrella.

Now that the lines of business are defined, using Finwiz, 5 relevant industry comps per branch were selected in order to estimate the equity beta. It is important to note that these comps were primarily chosen on the basis of revenue size, market cap, and line of business.

The comps selected for each branch are as follows:

DPEP: MGM Resorts International, Marriott Vacations Worldwide Corporation, Royal Caribbean, Hilton Grand Vacations, Comcast Corporation

DMED: Netflix, Inc., The Liberty Braves Group, Paramount Global, Warner Bros. Discovery, Inc., Comcast Corporation

It is important to note that Comcast was chosen as a comp for each branch due to their presence in the streaming/cable space as well as owning entertainment and tourist companies such as Universal Studios.

Now that our comps identified, the following information for each comp from its respective source was found:

- 5Y monthly Beta (Yahoo Finance)
- Debt (Most recent 10K statement)
- Market Cap (Yahoo Finance)
- Cash and Cash Equivalents (Most recent 10K statement)
- Debt Beta (Assumed 0.3 for our calculations)

Once I averaged out the unlevered betas from each line of business, an enterprise value to sales ratio was used in order to correctly weight each line of business with its respective target beta. For the DMED, it was decided to use the Broadcasting industry average enterprise value to sales ratio, and then multiplied this ratio by DMED's sales (obtained from the 10-k). The same was done for DPEP by using the Hotel/Gaming industry average enterprise value to sales ratio.
This helped determine how much the implied EV of each line of business contributed to the overall firm and allowed us to construct a weighted average of the unlevered betas of each line of business. With the firm unlevered beta, we can now relever it using Disney's debt to equity ratio. We can calculate Disney's debt to equity ratio using the debt and market cap. As discussed in class, it is assumed that the debt to equity ratio can be held constant and adjusted continuously (case 2) using the following formula:

$$\beta_E = \beta_U(1 + \frac{D}{E}) - \beta_D(\frac{D}{E})$$

This gives a levered beta of around 1.27. The same calculation is done for our cash adjusted beta which is 1.40.

Results:

Method	Beta
SCL Regression	1.21
Comps (Levered)	1.27
Comps (Levered Cash Adjusted)	1.40

The levered equity beta derived from the Security Characteristic Line regression was 1.21 and using comps, the levered equity beta derived was 1.27 and our levered cash adjusted beta

was 1.40. The comps provided us a beta that is similar to the beta provided by the SCL regression and actually falls within the 95% confidence interval as explained in Step 1.

Lessons Learned/Future Actions:

If given more time, there are some methods I would have taken to validate or adjust our assumptions.

First, it was assumed that all of the bonds of each company were investment grade, but it was found that MGM did not have investment grade bonds and had a lower credit rating. This would lead us to believe that a debt beta of 0.3 for all companies may not be entirely accurate and would have to be adjusted to account for that credit rating and higher risk of default.

Second, it was assumed that Yahoo Finance has the correct market capitalization listed. This may not be the case and we would need to calculate it by finding the number of shares outstanding and market price for each company analyzed to confirm.

Third, it was assumed a constant debt to equity ratio when this is not realistic or tested. I would need to look into the debt structure for each company and see if this assumption would be appropriate or if we need to use a method to account for constant debt or a constant debt to equity ratio adjusted annually.

Lastly, it was assumed that the Damodaran's data has the industry EV/Revenue ratios that include our comps, which may not be completely accurate for Disney. For the DMED, it is worth noting that the broadcasting industry was composed of many companies that were still very reliant on traditional cable, which is vastly different from Disney's business model that is heavily invested in streaming media. Therefore, Disney's media branch should be significantly higher than the industry multiple that was used because there is greater growth potential in streaming than traditional cable. On the other hand, for the DPEP, we used the hotel/gaming industry average.
One problem with this average was that the comparables were too broad, with companies such as Airbnb and Draftkings both in the industry list. It would have been helpful to have a list of comparables that were strictly resorts and hotels. I also noticed that there was a large difference in the enterprise value to sales ratio between these two industries. Another area of concern with these industry average multiples was the large difference between them. The DMED industry multiple was 1.85 while the DPEP multiple was 8.87. The inclusion of gaming companies in the DPEP is overexaggerating how high the DPEP multiple should be. To the contrary, as mentioned before the DMED multiple is lower than it should be due to using cable companies in the industry average.